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L1	11	(susan near coatney).in.	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/05/10 15:27
L2	6645	network adj (cache or buffer or storage)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/05/10 15:27
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L4	314823	server	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/05/10 15:27
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L10	2437907	switch\$4	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/05/10 15:28
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L12	20516	(storage\$2 or unit\$2 or device\$2 or disk\$2 or server\$2) adj (id or identification)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/05/10 15:28
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1 [The LOCKSS peer-to-peer digital preservation system](#)

Petros Maniatis, Mema Roussopoulos, T. J. Giuli, David S. H. Rosenthal, Mary Baker  
January 2005 **ACM Transactions on Computer Systems (TOCS)**, Volume 23 Issue 1

Full text available: pdf(715.30 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

The LOCKSS project has developed and deployed in a world-wide test a peer-to-peer system for preserving access to journals and other archival information published on the Web. It consists of a large number of independent, low-cost, persistent Web caches that cooperate to detect and repair damage to their content by voting in "opinion polls." Based on this experience, we present a design for and simulations of a novel protocol for voting in systems of this kind. It incorporates rate l ...

**Keywords:** Rate limiting, digital preservation, replicated storage

2 [Fast detection of communication patterns in distributed executions](#)

Thomas Kunz, Michiel F. H. Seuren  
November 1997 **Proceedings of the 1997 conference of the Centre for Advanced Studies on Collaborative research**

Full text available: pdf(4.21 MB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Understanding distributed applications is a tedious and difficult task. Visualizations based on process-time diagrams are often used to obtain a better understanding of the execution of the application. The visualization tool we use is Poet, an event tracer developed at the University of Waterloo. However, these diagrams are often very complex and do not provide the user with the desired overview of the application. In our experience, such tools display repeated occurrences of non-trivial commun ...

3 [Client-server computing in mobile environments](#)

Jin Jing, Abdelsalam Sumi Helal, Ahmed Elmagarmid  
June 1999 **ACM Computing Surveys (CSUR)**, Volume 31 Issue 2

Full text available: pdf(233.31 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#), [review](#)

Recent advances in wireless data networking and portable information appliances have engendered a new paradigm of computing, called mobile computing, in which users carrying portable devices have access to data and information services regardless of their physical


location or movement behavior. In the meantime, research addressing information access in mobile environments has proliferated. In this survey, we provide a concrete framework and categorization of the various way ...

**Keywords:** application adaptation, cache invalidation, caching, client/server, data dissemination, disconnected operation, mobile applications, mobile client/server, mobile computing, mobile data, mobility awareness, survey, system application

4 The state of the art in locally distributed Web-server systems

Valeria Cardellini, Emiliano Casalicchio, Michele Colajanni, Philip S. Yu

June 2002 **ACM Computing Surveys (CSUR)**, Volume 34 Issue 2

Full text available:  pdf(1.41 MB)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)


The overall increase in traffic on the World Wide Web is augmenting user-perceived response times from popular Web sites, especially in conjunction with special events. System platforms that do not replicate information content cannot provide the needed scalability to handle large traffic volumes and to match rapid and dramatic changes in the number of clients. The need to improve the performance of Web-based services has produced a variety of novel content delivery architectures. This article w ...

**Keywords:** Client/server, World Wide Web, cluster-based architectures, dispatching algorithms, distributed systems, load balancing, routing mechanisms

5 Bandwidth and traffic estimation techniques: A methodology for estimating interdomain web traffic demand

Anja Feldmann, Nils Kammenhuber, Olaf Maennel, Bruce Maggs, Roberto De Prisco, Ravi Sundaram

October 2004 **Proceedings of the 4th ACM SIGCOMM conference on Internet measurement**

Full text available:  pdf(1.08 MB)

Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

This paper introduces a methodology for estimating interdomain Web traffic flows between all clients worldwide and the servers belonging to over one thousand content providers. The idea is to use the server logs from a large content Delivery Network (CDN) to identify client downloads of content provider (i.e., publisher) Web pages. For each of these Web pages, a client typically downloads some objects from the content provider, some from the CDN, and perhaps some from third parties such as banner ...

**Keywords:** analysis, estimation, interdomain, traffic demand, traffic matrix, web

6 The session token protocol for forensics and traceback

Brian Carrier, Clay Shields

August 2004 **ACM Transactions on Information and System Security (TISSEC)**, Volume 7 Issue 3

Full text available:  pdf(331.18 KB)

Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)


In this paper we present the Session Token Protocol (STOP), a new protocol that can assist in the forensic analysis of a computer involved in malicious network activity. It has been designed to help automate the process of tracing attackers who log on to a series of hosts to hide their identity. STOP utilizes the Identification Protocol infrastructure, improving both its capabilities and user privacy. On request, the STOP protocol saves user-level and application-level data associated with a par ...

**Keywords:** Digital forensics, TCP traceback, auditing and intrusion detection, digital investigations, privacy

7 Authentication in distributed systems: theory and practice

Butler Lampson, Martín Abadi, Michael Burrows, Edward Wobber

November 1992 **ACM Transactions on Computer Systems (TOCS)**, Volume 10 Issue 4

Full text available:  [pdf\(3.37 MB\)](#)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#), [review](#)

We describe a theory of authentication and a system that implements it. Our theory is based on the notion of principal and a "speaks for" relation between principals. A simple principal either has a name or is a communication channel; a compound principal can express an adopted role or delegated authority. The theory shows how to reason about a principal's authority by deducing the other principals that it can speak for; authenticating a channel is one important application. We ...

**Keywords:** certification authority, delegation, group, interprocess communication, key distribution, loading programs, path name, principal, role, secure channel, speaks for, trusted computing base

8 Using proxy cache relocation to accelerate Web browsing in wireless/mobile communications

Stathes Hadjiefthymiades, Lazaros Merakos

April 2001 **Proceedings of the tenth international conference on World Wide Web**

Full text available:  [pdf\(321.90 KB\)](#)

Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

**Keywords:** W4, cache relocation, learning automaton, mobile computing, path prediction, proxy cache

9 Enabling full service surrogates using the portable channel representation

Micah Beck, Terry Moore, Leif Abrahamsson, Christophe Achouiantz, Patrick Johansson

April 2001 **Proceedings of the tenth international conference on World Wide Web**

Full text available:  [pdf\(282.92 KB\)](#)

Additional Information: [full citation](#), [references](#), [index terms](#)

**Keywords:** content distribution, dynamic content, mirroring, portability, replication, surrogate, web server

10 Robustness: Defensive programming: using an annotation toolkit to build DoS-resistant software

Xiaohu Qie, Ruoming Pang, Larry Peterson

December 2002 **ACM SIGOPS Operating Systems Review**, Volume 36 Issue SI

Full text available:  [pdf\(2.13 MB\)](#)

Additional Information: [full citation](#), [abstract](#), [references](#)

This paper describes a toolkit to help improve the robustness of code against DoS attacks. We observe that when developing software, programmers primarily focus on functionality. Protecting code from attacks is often considered the responsibility of the OS, firewalls and intrusion detection systems. As a result, many DoS vulnerabilities are not discovered until the system is attacked and the damage is done. Instead of reacting to attacks after the

fact, this paper argues that a better solution i ...

11 Interposed request routing for scalable network storage

February 2002 **ACM Transactions on Computer Systems (TOCS)**, Volume 20 Issue 1

Full text available:  pdf(363.12 KB)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#), [review](#)


This paper explores interposed request routing in Slice, a new storage system architecture for high-speed networks incorporating network-attached block storage. Slice interposes a request switching filter---called a *μproxy*---along each client's network path to the storage service (e.g., in a network adapter or switch). The *μproxy* intercepts request traffic and distributes it across a server ensemble. We propose request routing schemes for I/O and file service traffic, and explore th ...

**Keywords:** Content switch, file server, network file system, network storage, request redirection, service virtualization

12 System support for pervasive applications

Robert Grimm, Janet Davis, Eric Lemar, Adam Macbeth, Steven Swanson, Thomas Anderson, Brian Bershad, Gaetano Borriello, Steven Gribble, David Wetherall

November 2004 **ACM Transactions on Computer Systems (TOCS)**, Volume 22 Issue 4

Full text available:  pdf(1.82 MB)

Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Pervasive computing provides an attractive vision for the future of computing. Computational power will be available everywhere. Mobile and stationary devices will dynamically connect and coordinate to seamlessly help people in accomplishing their tasks. For this vision to become a reality, developers must build applications that constantly adapt to a highly dynamic computing environment. To make the developers' task feasible, we present a system architecture for pervasive computing, called & ...

**Keywords:** Asynchronous events, checkpointing, discovery, logic/operation pattern, migration, one.world, pervasive computing, structured I/O, tuples, ubiquitous computing

13 Accelerating telnet performance in wireless networks

Barron Housel, Ian Shields

August 1999 **Proceedings of the 1st ACM international workshop on Data engineering for wireless and mobile access**

Full text available:  pdf(933.49 KB)


Additional Information: [full citation](#), [references](#), [index terms](#)

**Keywords:** caching, compression, data reduction, emulation, mobile, sessions, telnet, wireless

14 Packet classification using tuple space search

V. Srinivasan, S. Suri, G. Varghese

August 1999 **ACM SIGCOMM Computer Communication Review , Proceedings of the conference on Applications, technologies, architectures, and protocols for computer communication**, Volume 29 Issue 4

Full text available:  pdf(1.46 MB)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Routers must perform packet classification at high speeds to efficiently implement functions such as firewalls and QoS routing. Packet classification requires matching each packet

against a database of filters (or rules), and forwarding the packet according to the highest priority filter. Existing filter schemes with fast lookup time do not scale to large filter databases. Other more scalable schemes work for 2-dimensional filters, but their lookup times degrade quickly with each additional dime ...

**15** Proxies + path prediction: improving Web service provision in wireless-mobile communications

Stathes Hadjiefthymiades, Lazaros Merakos

August 2003 **Mobile Networks and Applications**, Volume 8 Issue 4

Full text available:  [pdf\(255.84 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Mobile computing is considered of major importance to the computing industry for the forthcoming years due to the progress in the wireless communications area. A proxy-based architecture for accelerating Web browsing in wireless customer premises networks is presented. Proxy caches, maintained in base stations, are constantly relocated to follow the roaming user. A cache management scheme is proposed, which involves the relocation of full caches to the most probable cells but also percentages of ...

**Keywords:** cache relocation, caching proxy, mobile computing, path prediction algorithm

**16** Manageability, availability, and performance in porcupine: a highly scalable, cluster-based mail service

Yasushi Saito, Brian N. Bershad, Henry M. Levy

August 2000 **ACM Transactions on Computer Systems (TOCS)**, Volume 18 Issue 3

Full text available:  [pdf\(2.52 MB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

This paper describes the motivation, design and performance of Porcupine, a scalable mail server. The goal of Porcupine is to provide a highly available and scalable electronic mail service using a large cluster of commodity PCs. We designed Porcupine to be easy to manage by emphasizing dynamic load balancing, automatic configuration, and graceful degradation in the presence of failures. Key to the system's manageability, availability, and performance is that sessions, data, and underlying ...

**Keywords:** cluster, distributed systems, email, group membership protocol, load balancing, replication

**17** Papers: ESW4: enhanced scheme for WWW computing in wireless communication environments

Stathes Hadjiefthymiades, Lazaros Merakos

October 1999 **ACM SIGCOMM Computer Communication Review**, Volume 29 Issue 5

Full text available:  [pdf\(1.18 MB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#)


Mobile computing is considered of major importance to the computing industry for the forthcoming years due to the progress in the wireless communications domain. In this paper, we present a proxy-based architecture, called ESW4, which manages to accelerate Web browsing in wireless CPNs. Proxy caches, maintained in base stations, are constantly relocated to accompany the roaming user. We discuss a cache management scheme involving the relocation of full caches to the most candidate cells but also ...

**18** IO-Lite: a unified I/O buffering and caching system

Vivek S. Pai, Peter Druschel, Willy Zwaenepoel

February 2000 **ACM Transactions on Computer Systems (TOCS)**, Volume 18 Issue 1

Full text available: Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index](#)

 [pdf\(196.15 KB\)](#)

[terms](#)

This article presents the design, implementation, and evaluation of IO -Lite, a unified I/O buffering and caching system for general-purpose operating systems. IO-Lite unifies all buffering and caching in the system, to the extent permitted by the hardware. In particular, it allows applications, the interprocess communication system, the file system, the file cache, and the network subsystem to safely and concurrently share a single physical copy of the data. Protection and ...

**Keywords:** I/O buffering, caching, networking, zero-copy

## 19 [Rethinking the design of the Internet: the end-to-end arguments vs. the brave new world](#)

Marjory S. Blumenthal, David D. Clark

August 2001 **ACM Transactions on Internet Technology (TOIT)**, Volume 1 Issue 1

Full text available:  [pdf\(176.33 KB\)](#)


Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

This article looks at the Internet and the changing set of requirements for the Internet as it becomes more commercial, more oriented toward the consumer, and used for a wider set of purposes. We discuss a set of principles that have guided the design of the Internet, called the end-to-end arguments, and we conclude that there is a risk that the range of new requirements now emerging could have the consequence of compromising the Internet's original design principles. Were ...

**Keywords:** ISP, Internet, end-to-end argument

## 20 [Process migration](#)

September 2000 **ACM Computing Surveys (CSUR)**, Volume 32 Issue 3

Full text available:  [pdf\(1.24 MB\)](#)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#), [review](#)

Process migration is the act of transferring a process between two machines. It enables dynamic load distribution, fault resilience, eased system administration, and data access locality. Despite these goals and ongoing research efforts, migration has not achieved widespread use. With the increasing deployment of distributed systems in general, and distributed operating systems in particular, process migration is again receiving more attention in both research and product development. As hi ...

**Keywords:** distributed operating systems, distributed systems, load distribution, process migration

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